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09/845,619	04/30/2001	Ladislav R. Pust	S01.12-0721	2604

7590 09/04/2003  
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EXAMINER

MILLER, BRIAN E

ART UNIT	PAPER NUMBER
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2652

DATE MAILED: 09/04/2003

7

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

09/845,619

Applicant(s)

PUST ET AL.

Examiner

Brian E. Miller

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 24 June 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-19 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-19 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☒ The proposed drawing correction filed on 24 June 2003 is: a) ☒ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

## Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 2.
- 4) ☐ Interview Summary (PTO-413) Paper No(s) \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

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Claims 1-19 are pending.

***Drawings***

1. New replacement drawings for FIGs. 2-5, 8 were received on 6/24/03. These drawings are approved by the Examiner.

***Claim Rejections - 35 USC § 112***

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 1-19 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. All the independent claims, i.e., 1, 13, 19, contain language, e.g., "having a thickness that is large enough to compensate effectively for thermal expansion" is indefinite. It is not readily apparent what thickness encompasses "large enough" to thereby "compensate effectively". Furthermore, it is not readily apparent what constitutes "to compensate effectively".

***Claim Rejections - 35 USC § 102***

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claims 1-19 are rejected under 35 U.S.C. 102(b) as being anticipated by Koshikawa et al (US 5,898,542). Koshikawa et al discloses a MR head for a magnetic disk drive (see FIG. 8), the

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head (referring to FIG. 5) including: a substrate 1 made of a material (AlTiC) with a thermal expansion rate CTE1 (7.9); a transducer (at least including elements 7-9) bonded to the substrate (through insulate layer 4) composed of materials, e.g., Cu, NiFe, with a thermal expansion rate CTE2 (Cu-16.5, NiFe-12.2) that is greater than CTE1 (7.9); a first restraint layer 5 that has a bond to a side of the transducer and is formed of a material (SiO<sub>2</sub>) having a thermal expansion rate CTE3 (1.0) that is less than CTE1 (7.9). See also col. 1, lines 35-51 for the description of the head, and col. 2, lines 51-57 for the use of materials. With the above construction, it is considered that combination of the restraint layer(s) and transducer bonded together to have a combined expansion rate that is substantially matched with CTE1 (re claims 2, 5); wherein the first restraint layer has dimensions and material properties that are selected to limit protrusion of the transducer beyond the substrate over an operating temperature range (see col. 5, lines 13-21) (re claim 3); a second restraint layer 4 that has a bond to a second one of the sides of the transducer, and that is formed of a material (SiO<sub>2</sub>) has a thermal expansion rate CTE4 (1.0) that is less than CTE1 (7.9) (re claim 4); a third layer 9 that has a bond to the second restraint layer (re claim 6); wherein a bonding film 7 is between the second restraint layer 4 and the third layer 9 (re claim 7); wherein the first constraint layer has a width that is substantially the width of the transducer and substrate (see FIG. 6(b)) (re claims 8-9); substrate has a CTE between 7-8.3, i.e., 7.9 (re claim 10); the transducer comprises metals with thermal expansion rates in the range of 12 to 17 (NiFe-12.2) (re claim 11); the first constraint layer comprises material with a thermal expansion rate of about 1.0-4.3 (SiO<sub>2</sub>-1.0) (re claim 12).

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With respect to claims 13-17, the above structure is considered to encompass the method steps as claimed. Claim 18 is considered to also be encompassed by the above structure since the first restraint layer 4 is a thin film and deposited on another thin film, i.e., 8 (NiFe).

With respect to the newly added language to the independent claims, e.g., "the first restraint layer having a thickness that is large enough...and the transducer", and in view of the 112 paragraph 2 rejection, above, it is considered to be encompassed by Koshikawa et al.

6. Claims 1-11, 13-19 are rejected under 35 U.S.C. 102(b) as being anticipated by Okai et al (US 5,687,045). Okai et al discloses a MR head for a magnetic disk drive (see FIG. 16), the head (referring to FIGs. 1-2) including: a substrate 11 made of a material (AlTiC) with a thermal expansion rate CTE1 (7.9); a transducer (at least including elements 13-15) bonded to the substrate (through insulate layer 12) composed of materials, e.g., Cu, NiFe, with a thermal expansion rate CTE2 (Cu-16.5, NiFe-12.2) that is greater than CTE1 (7.9); a first restraint layer 17 that has a bond to a side of the transducer and is formed of a material ( $\text{Al}_2\text{O}_3\text{-SiO}_2$ ) having a thermal expansion rate CTE3 (taking a 60% weight of  $\text{Al}_2\text{O}_3$  at a CTE of 7.8 and 40% weight of  $\text{SiO}_2$  with a CTE of 1.0 the overall CTE would be about 5.0) that is less than CTE1 (7.9). See also col. 13, line 19 to col. 14, line 15 for the description of the head. With the above construction, it is considered that combination of the restraint layer(s) and transducer bonded together to have a combined expansion rate that is substantially matched with CTE1 (re claims 2, 5); wherein the first restraint layer has dimensions and material properties that are selected to limit protrusion of the transducer beyond the substrate over an operating temperature range (see col. 14, lines 2-7) (re claim 3); a second restraint layer 12 that has a bond to a second one of the sides of the transducer, and that is formed of a material ( $\text{Al}_2\text{O}_3\text{-SiO}_2$ ) has a thermal expansion rate

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CTE4 (same as CTE3 as discussed above) that is less than CTE1 (7.9) (re claim 4); a third layer 14 that has a bond to the second restraint layer (re claim 6); wherein a bonding film 13 is between the second restraint layer 12 and the third layer 14 (re claim 7); wherein the first constraint layer has a width that is substantially the width of the transducer and substrate (see FIG. 1) (re claims 8-9); substrate has a CTE between 7-8.3, i.e., 7.9 (re claim 10); the transducer comprises metals with thermal expansion rates in the range of 12 to 17 (NiFe-12.2) (re claim 11). With respect to claims 13-17, the above structure is considered to encompass the method steps as claimed. Claim 18 is considered to also be encompassed by the above structure since the first restraint layer 17 is a thin film and deposited on another thin film, i.e., 13 (NiFe). With respect to the newly added language to the independent claims, e.g., "the first restraint layer having a thickness that is large enough...and the transducer", and in view of the 112 paragraph 2 rejection, above, it is considered to be encompassed by Okai et al.

### ***Response to Amendment***

7. Applicant's arguments filed 6/24/03 have been fully considered but they are not persuasive. Applicant asserts that "Koshikawa et al does not teach that the protection layer 5 can be used for restraint of thermal expansion."

In response, the Examiner considers that the protection layer could be used as a restraint layer for thermal expansion, at least for the reason that the claimed CTE values and materials are encompassed by Koshikawa et al. The same is true for Okai et al.

The claims need to set forth layer sequences more particularly to overcome the cited references.

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***Conclusion***

8. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

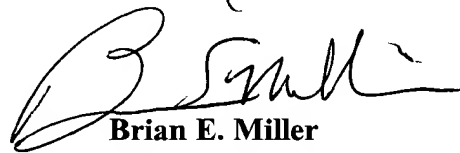
A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Brian E. Miller whose telephone number is (703) 308-2850. The examiner can normally be reached on M-F 7:45am-5:15pm (FF off).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Hoa T. Nguyen can be reached on (703) 305-9687. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9314 for regular communications and (703) 872-9314 for After Final communications.

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Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 305-4750.

A handwritten signature in black ink, appearing to read "B. Miller", is written over the printed name.

**Brian E. Miller**  
**Primary Examiner**  
**Art Unit 2652**

bem  
September 1, 2003